

200

FIG. 2

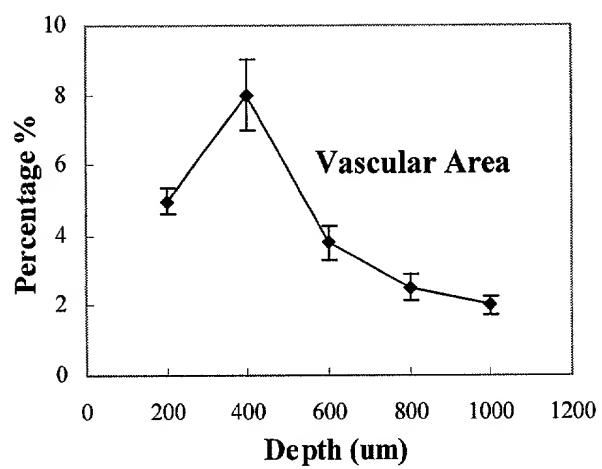


FIG. 3A

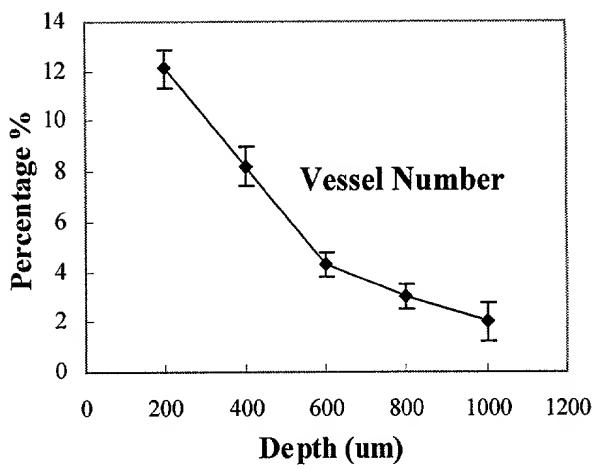


FIG. 3B

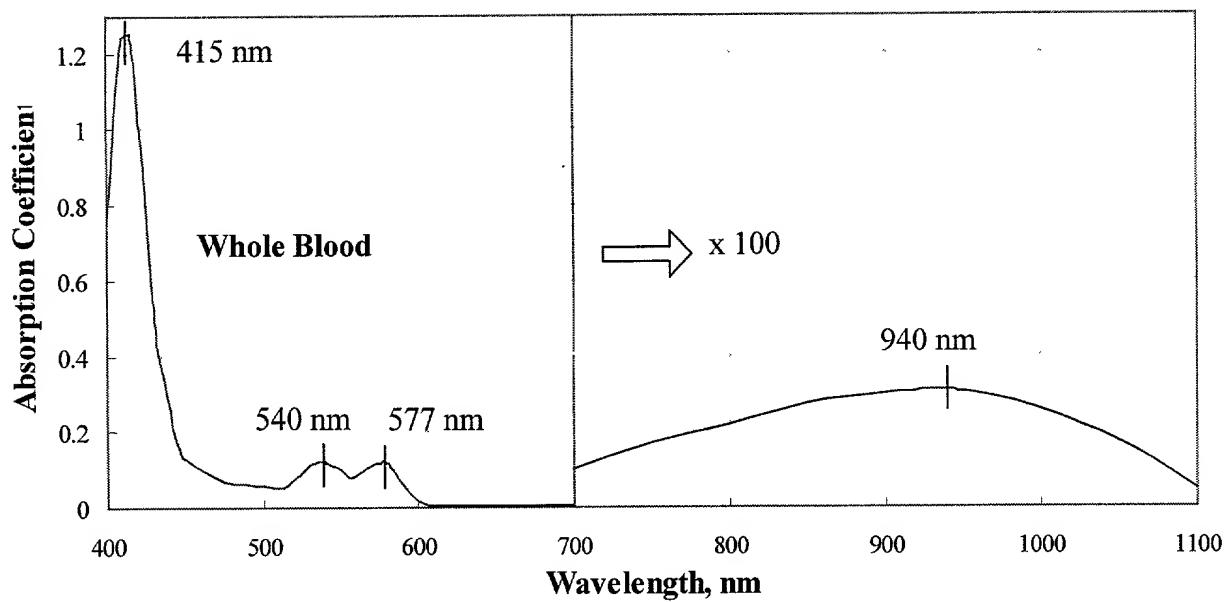


FIG. 4

Laser	Wavelength (nm)	Treat Fluence (J/cm ²)	Type
Argon	488, 514	1-10	CW
Classic KTP	532	10-40	CW
Cu or Cu-Br	512-578	1-10	CW
Krypton	570	1-10	CW
Pulse dye (yellow)	585	4-8	Pulsed
Derm-KTP	532	2-20	Pulsed
Pulsed dye (green)	510	3-5	Pulsed
Q-sw. Nd:YAG – green - infrared	532 1064	3-5 4-10	Pulsed
Q-sw. Ruby (red)	694	4-10	Pulsed
Q-sw. Alexandrite (infrared)	755	4-10	Pulsed

FIG. 5

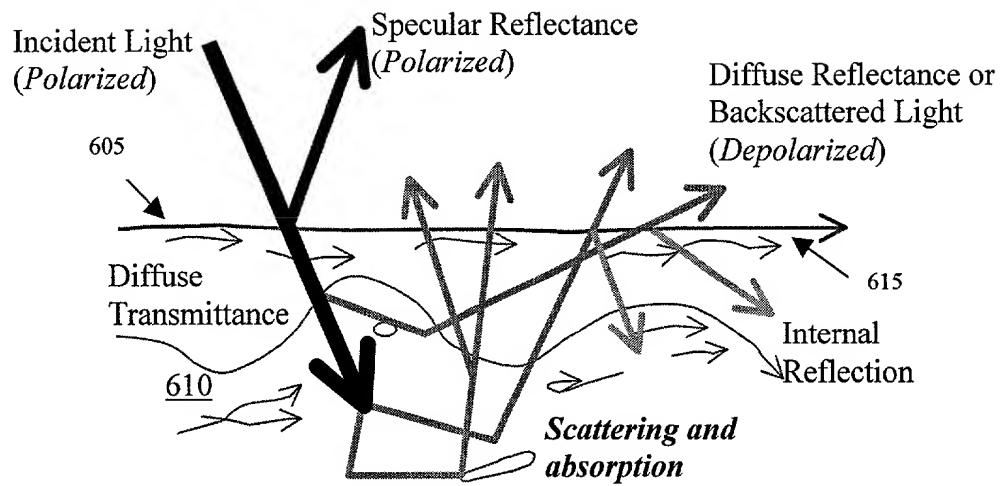


FIG. 6

Tissue	$\lambda \text{ (nm)}$	$\mu_a \text{ (mm}^{-1}\text{)}$	$\mu_s \text{ (mm}^{-1}\text{)}$	G	$\mu_s' \text{ (mm}^{-1}\text{)}$	$\mu_t \text{ (mm}^{-1}\text{)}$
Human dermis	633	0.27	18.7	0.81	3.553	3.823

FIG. 7

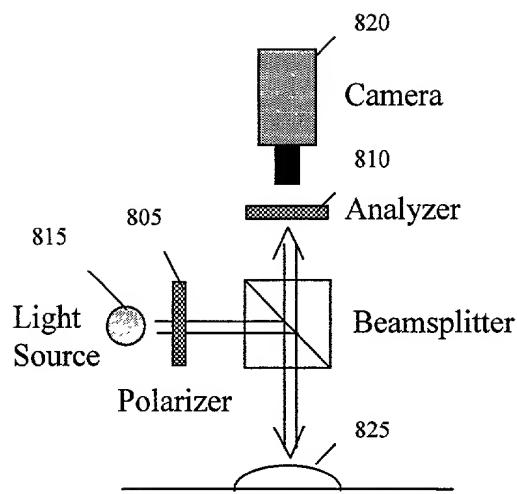


FIG. 8A

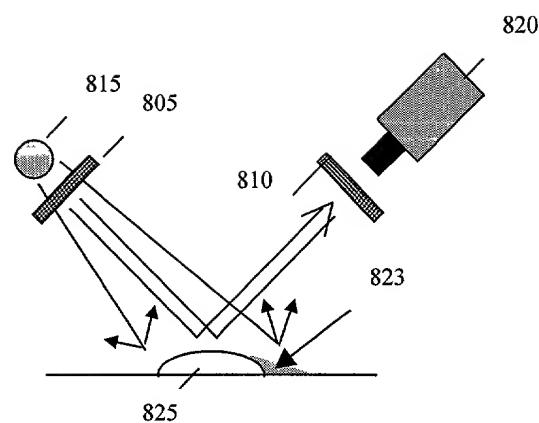


FIG. 8B

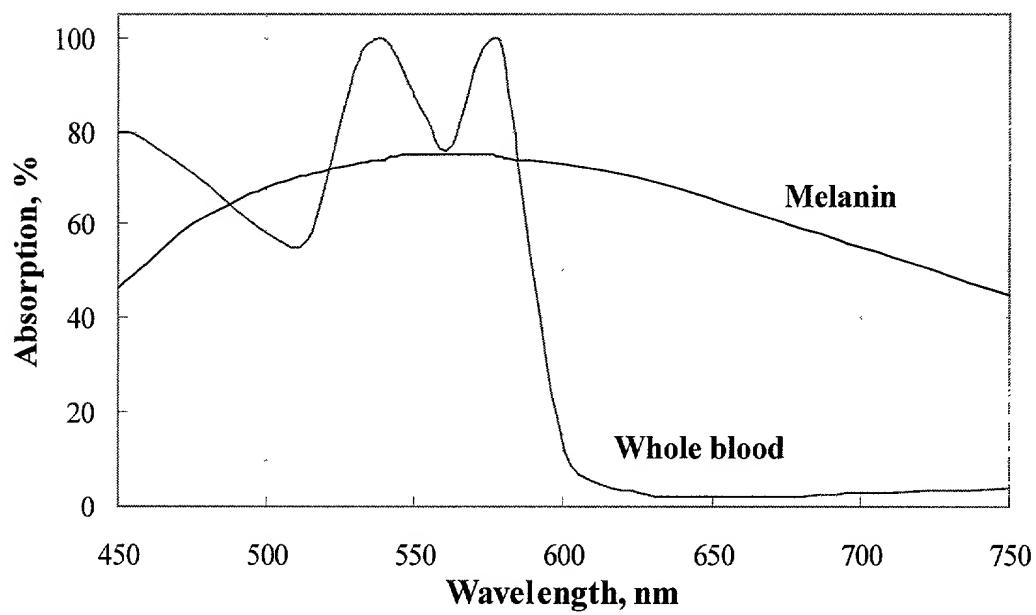


FIG. 9

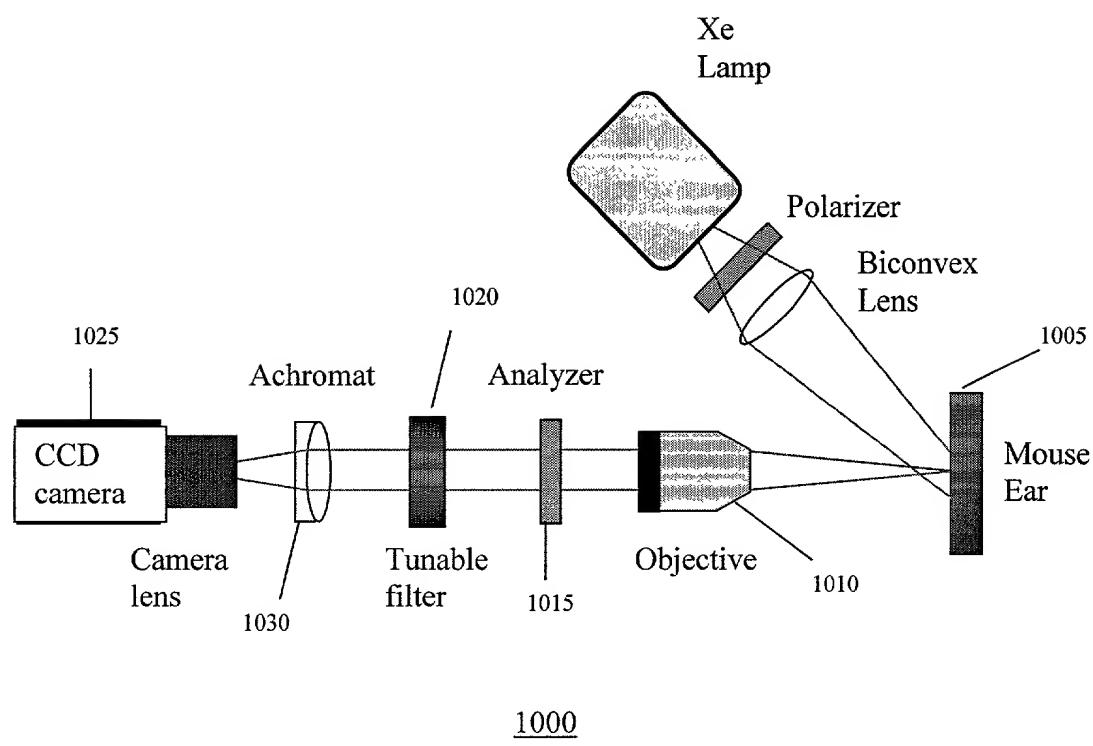


FIG. 10

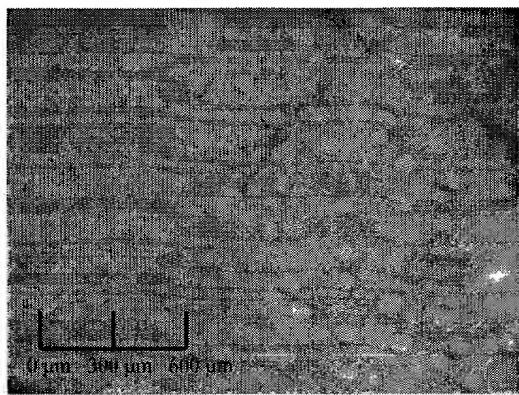


FIG. 11A

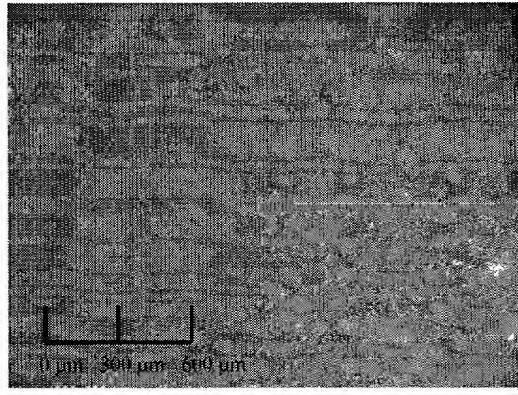


FIG. 11B

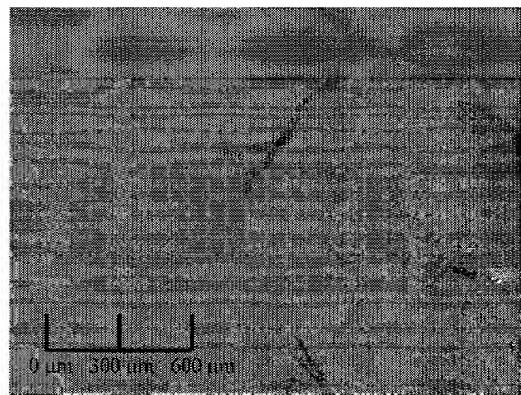


FIG. 11C

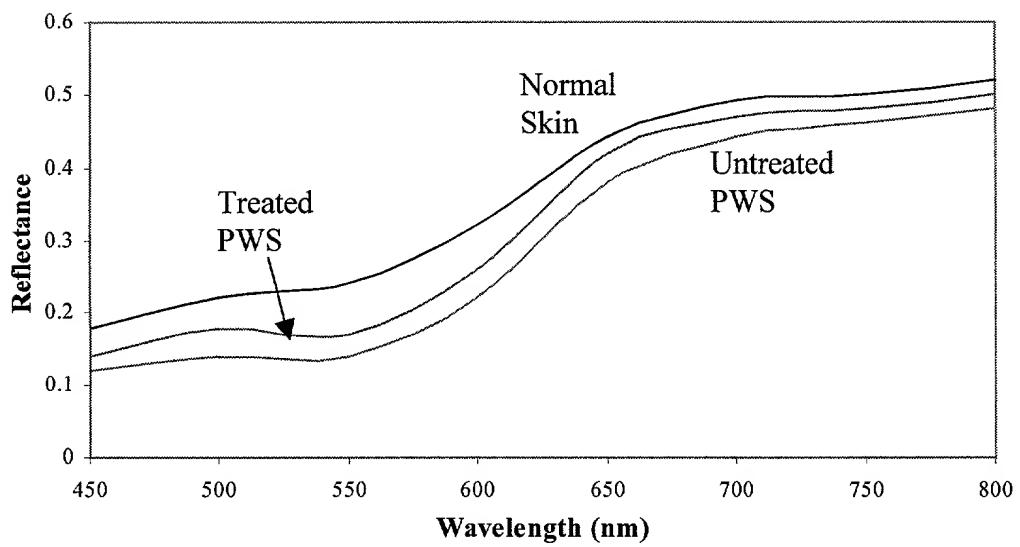
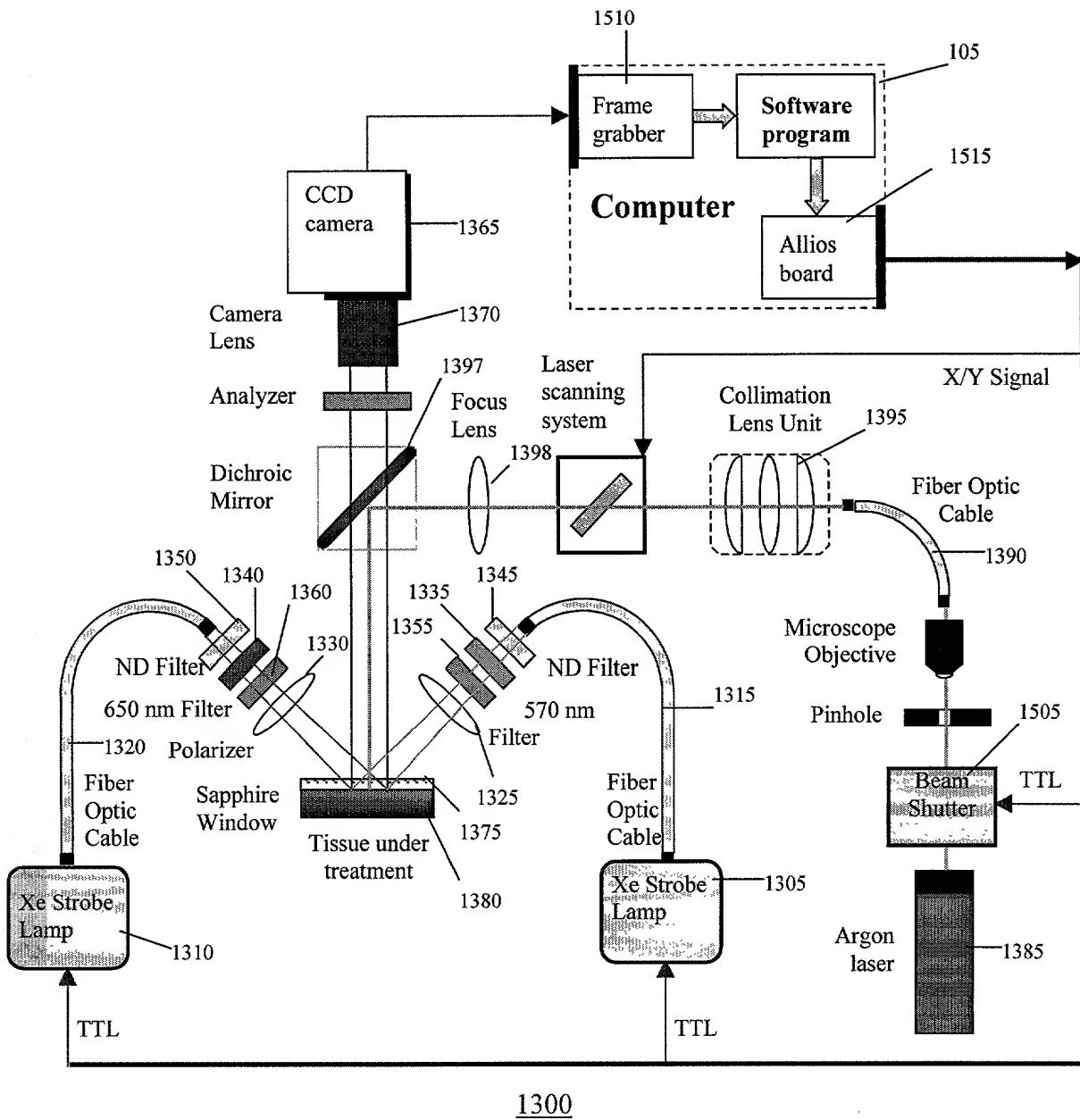


FIG. 12



1300

FIG. 13

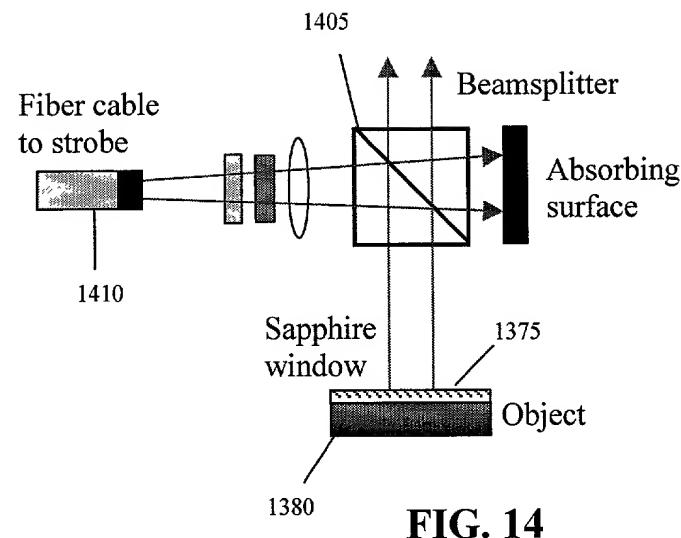


FIG. 14

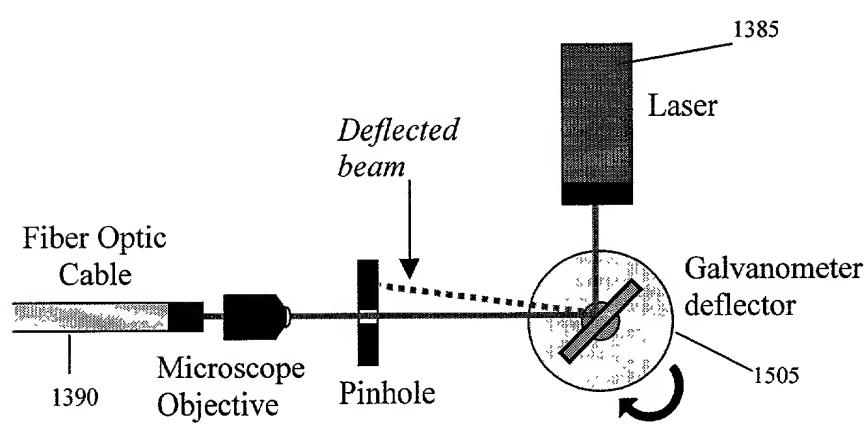
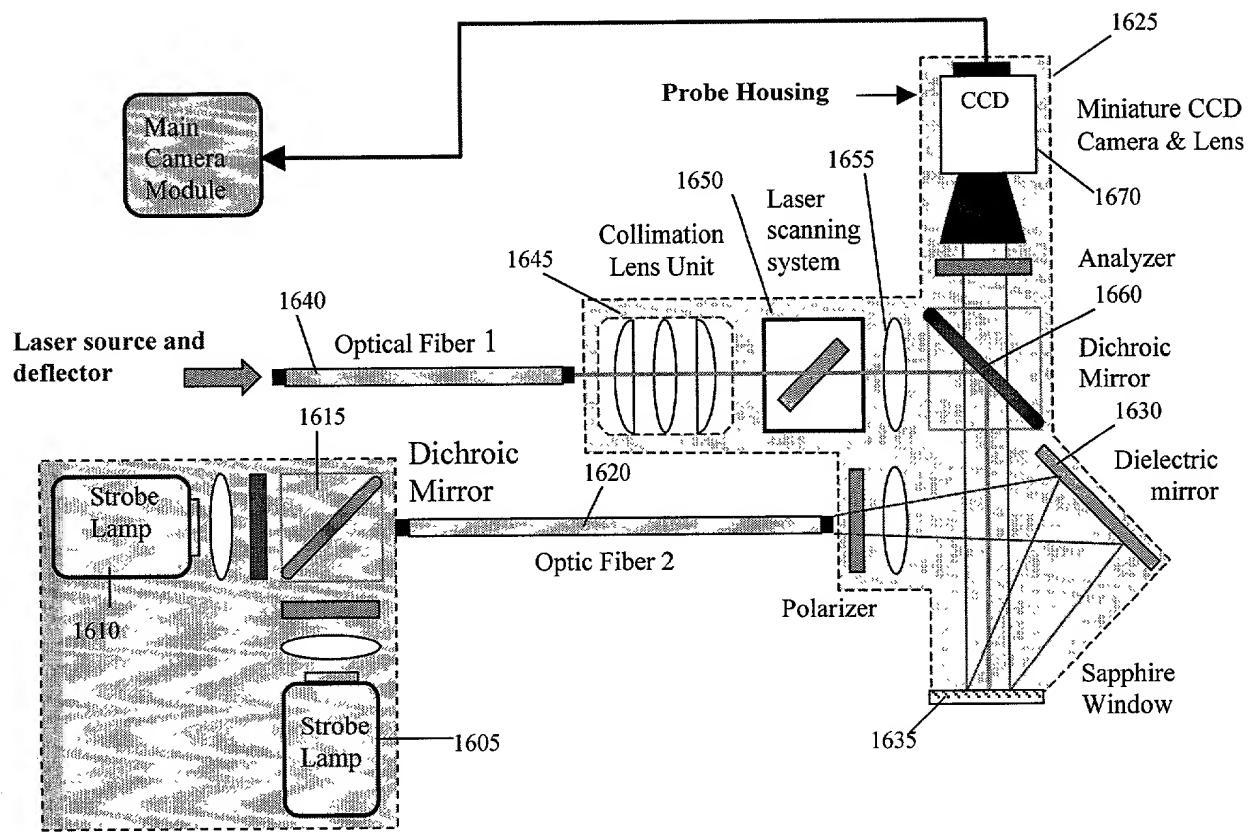


FIG. 15



1600

FIG. 16

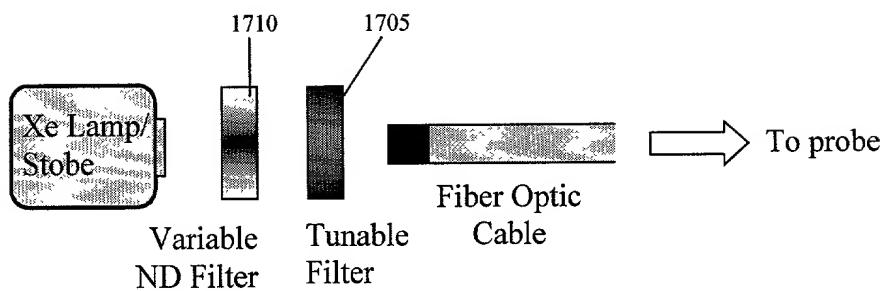


FIG. 17

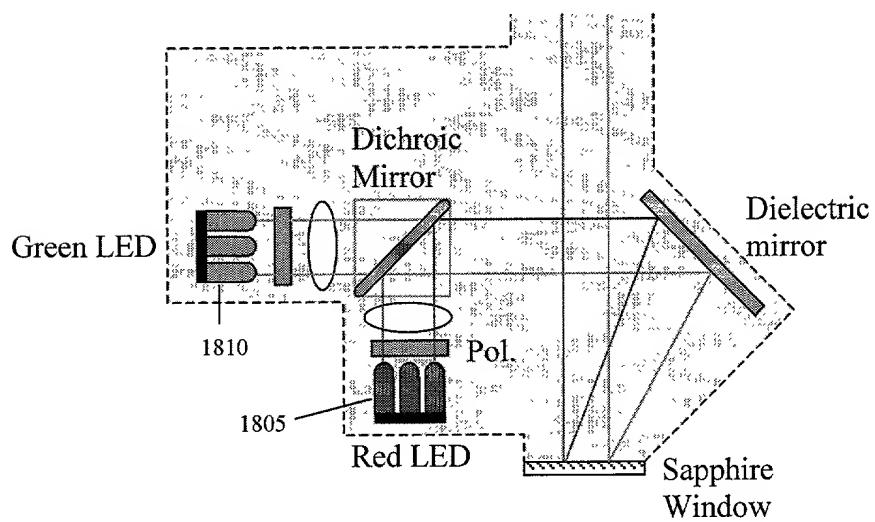


FIG. 18

Parabolic Line Profile

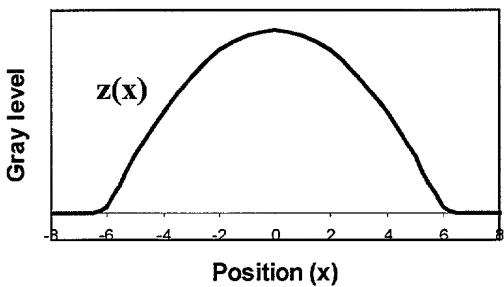


FIG. 19A

First Derivative Profile

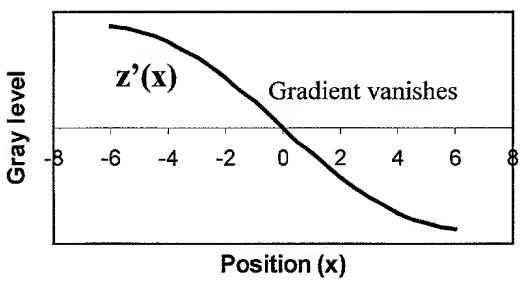


FIG. 19B

Second Derivative Profile

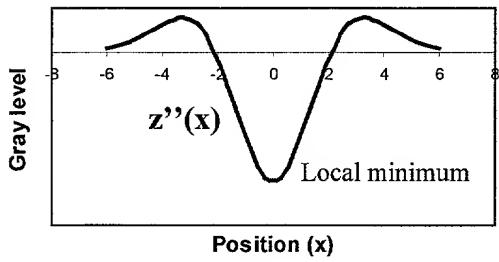


FIG. 19C

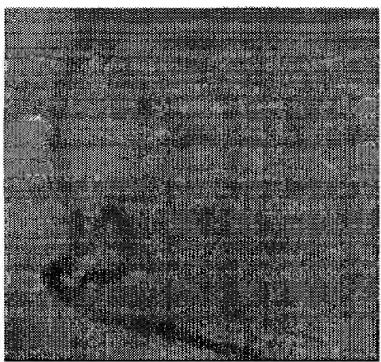


FIG. 20A

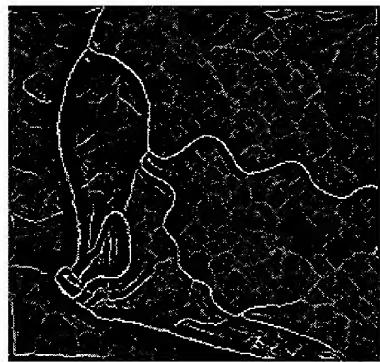


FIG. 20B

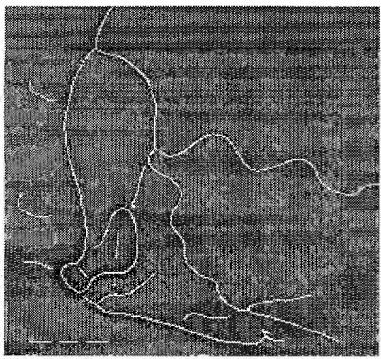


FIG. 20C

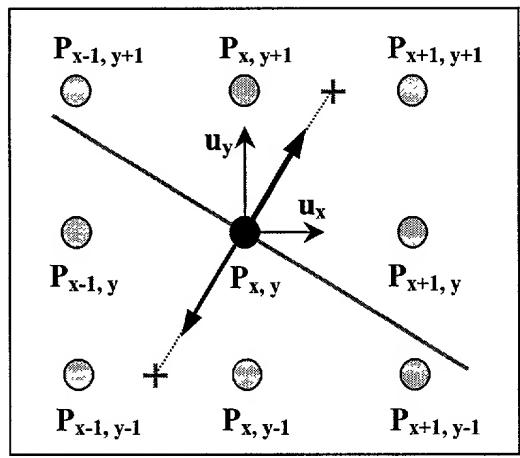


FIG. 21

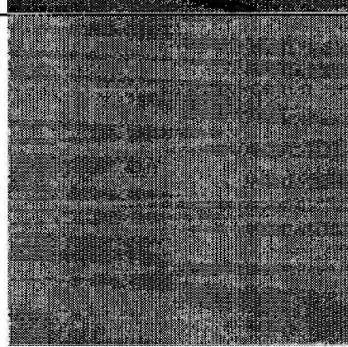
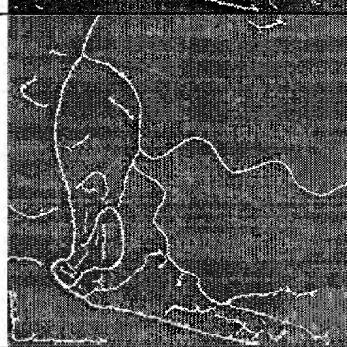
Characteristic of Noise Added	Noise added image	Result of algorithm
No noise added		
$\mu = 0.0$ $\sigma = 0.00008$		
$\mu = 0.0$ $\sigma = 0.0002$		
Histogram rescaled to reduce contrast		

FIG. 22

No.	Process	Time (sec)
1.	Direct Convolution: $\sigma = 3.0$	3.9
2a.	Recursive Filtering: $\sigma = 3.0$ 4^{th} order IIR filter	3.3
2b.	3^{rd} order IIR filter	3.0

FIG. 23

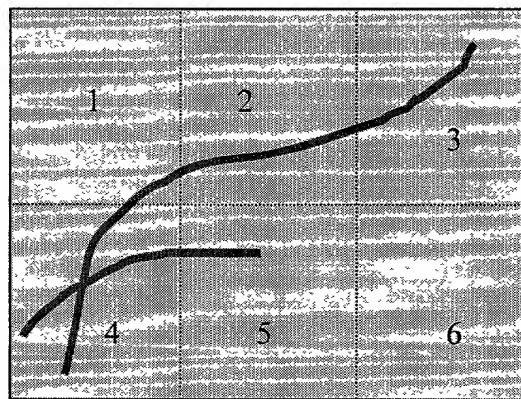


FIG. 24A

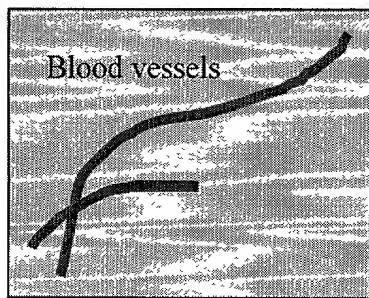


FIG. 24B

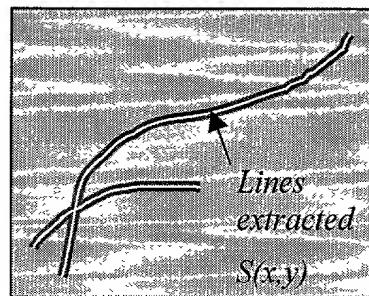


FIG. 24C

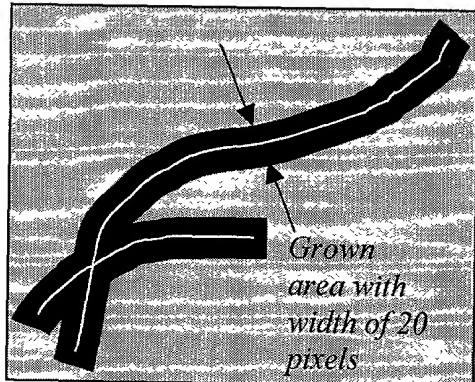


FIG. 24D

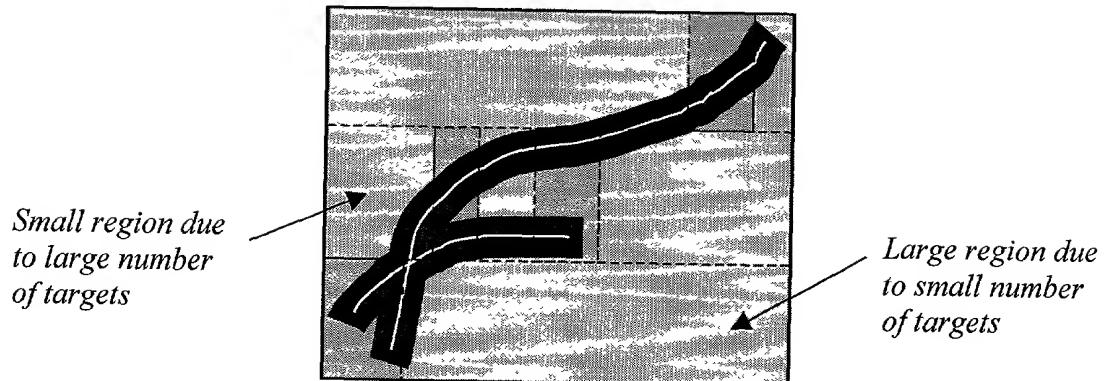


FIG. 24E

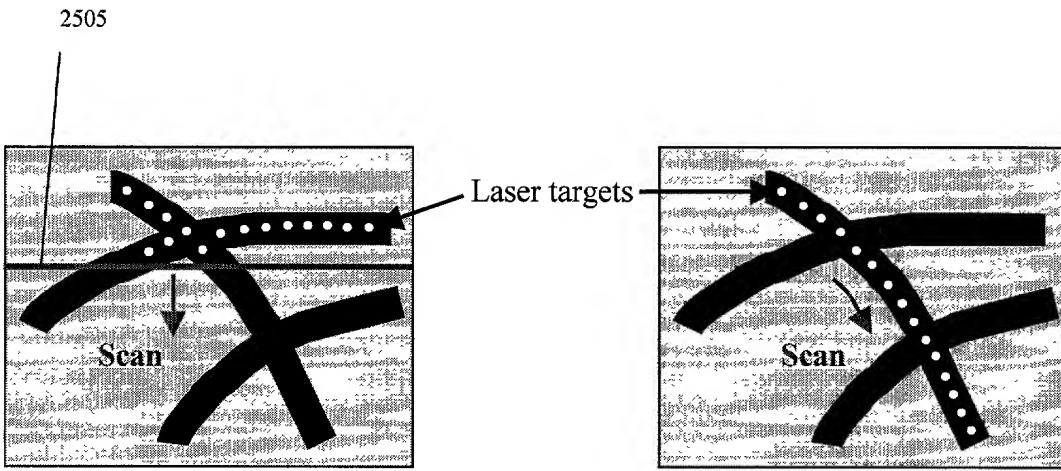


FIG. 25A

FIG. 25B

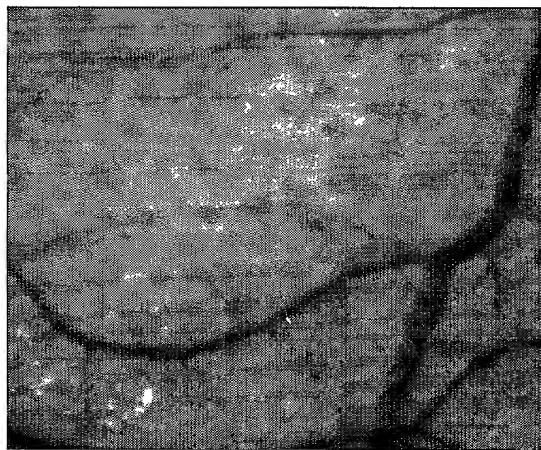


FIG. 26A

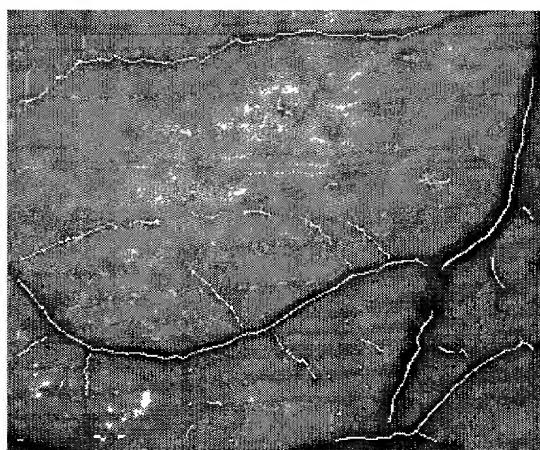


FIG. 26B

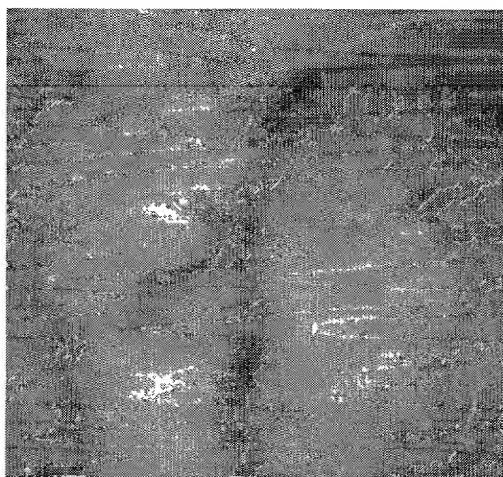


FIG. 27A

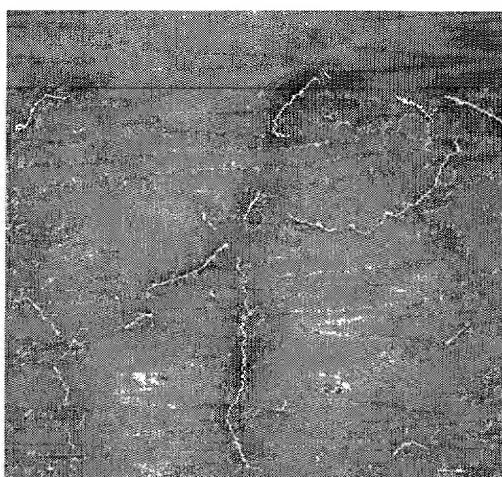
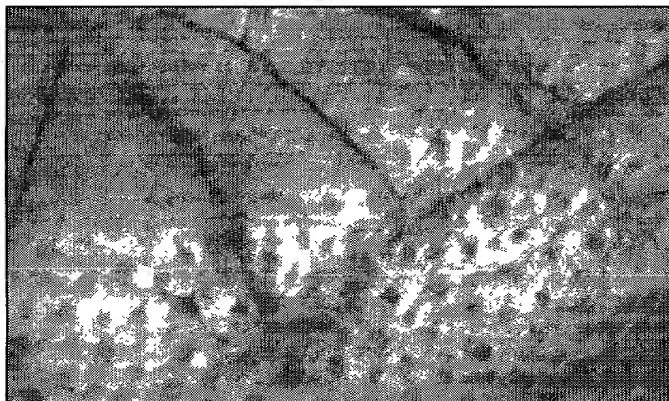


FIG. 27B

Laser	Coherent Innova 100 CW Argon Laser
Wavelength	514 nm
Beam diameter	750 μ m
Power	1 watt
Pulse width	80 ms (CW laser pulsed mechanically)
Fluence	18.1×10^4 J/m ²

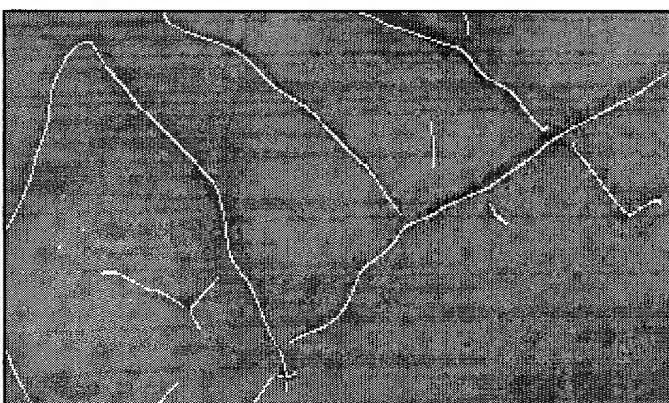
Treatment laser parameters

FIG. 28



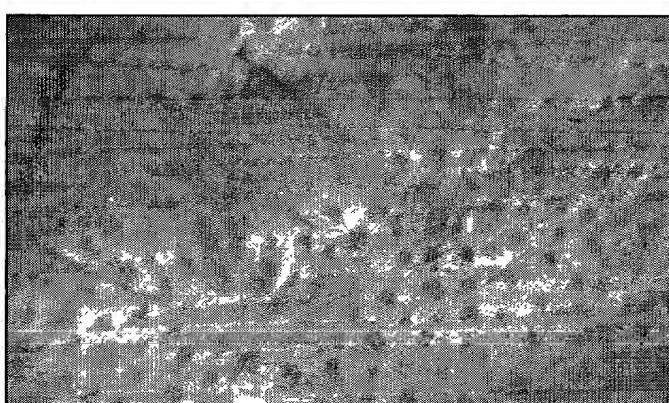
*Blood vessels before treatment
(illumination at 577 nm).*

FIG. 29A



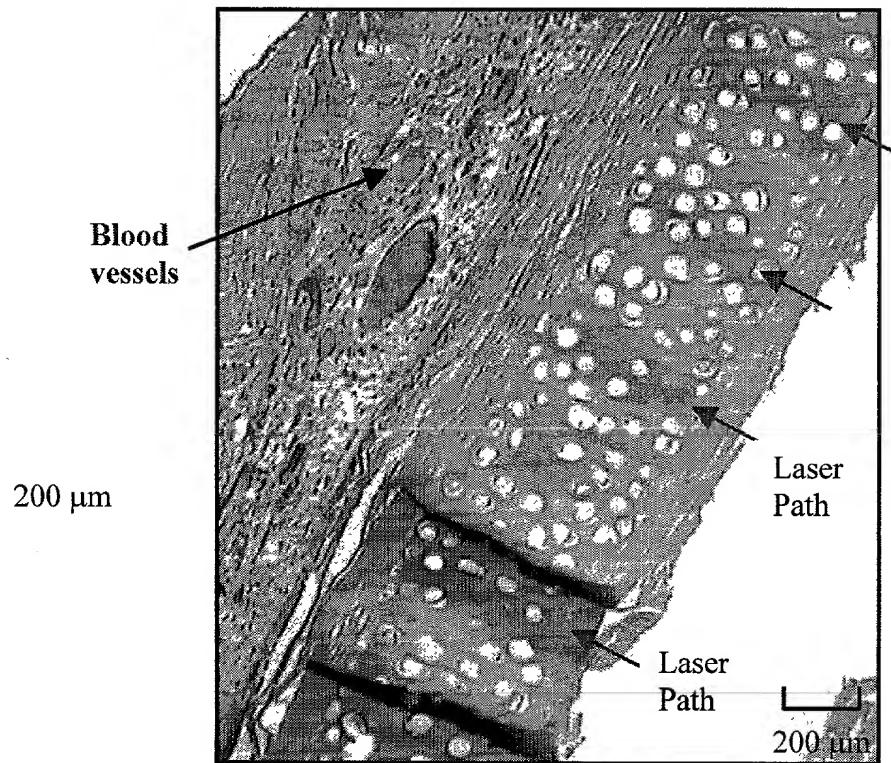
*Targets identified by the Smart
Scalpel.*

FIG. 29B



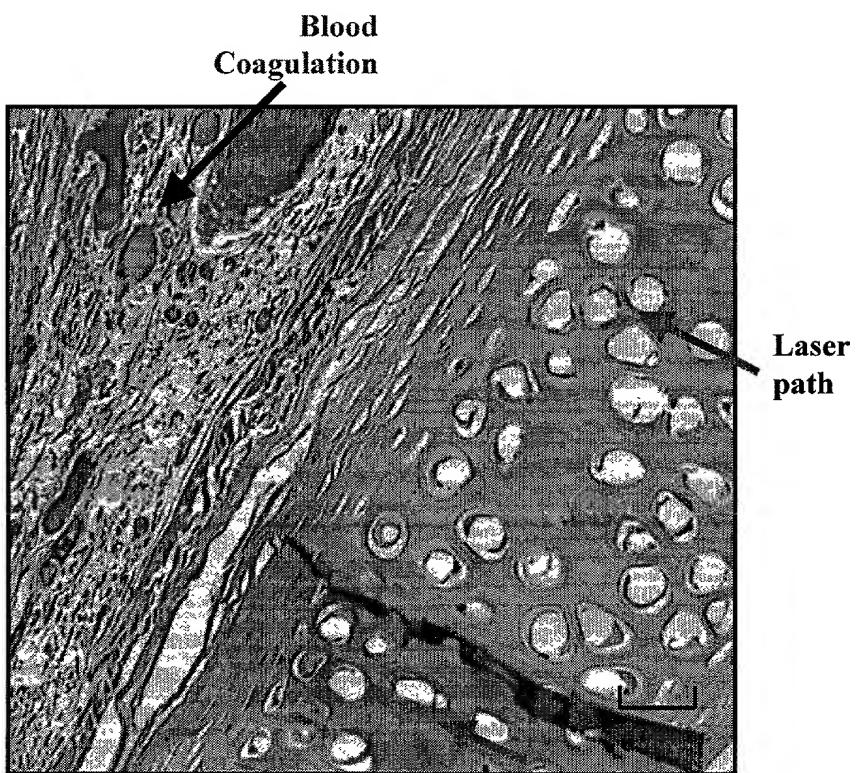
*Blood vessels immediately after
treatment.*

FIG. 29C



Histology results

FIG. 30



Close-up view showing coagulated blood vessels

FIG. 31

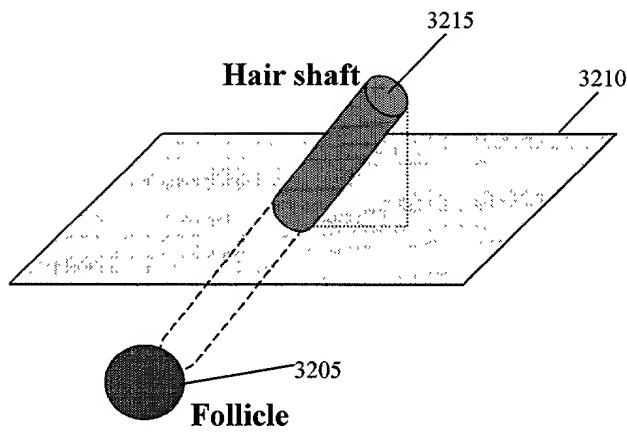


FIG. 32A

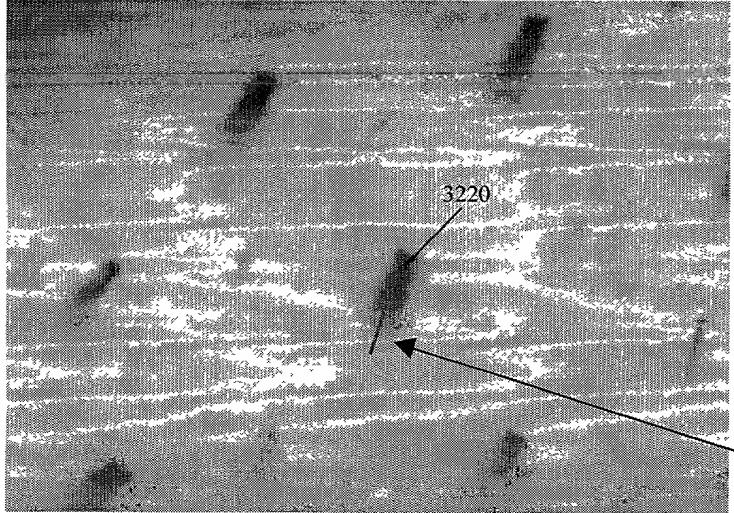


FIG. 32B

Hair follicle
beneath the skin
can lie anywhere
along this red line.

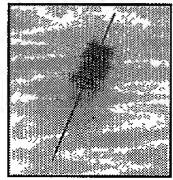


FIG. 32C

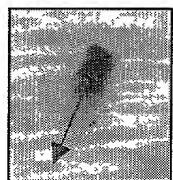
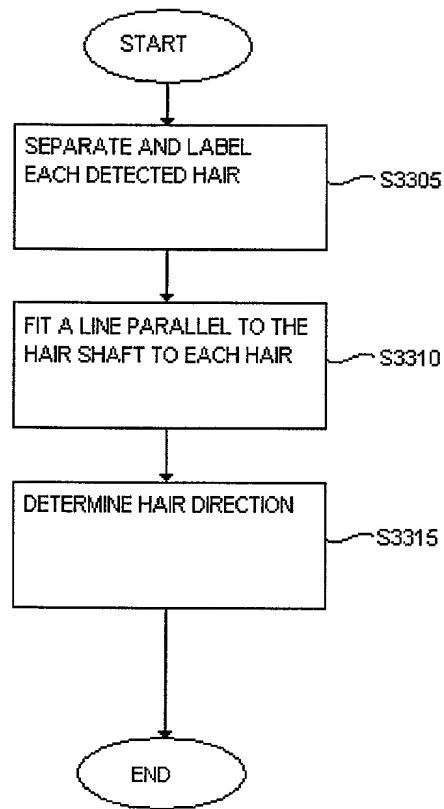


FIG. 32D



3300

FIG. 33